[] Dendrochronology Program Library Run APPGA Program COF 10:35 Mon 12 Feb 2007 Page 1

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[] P R O G R A M C O F E C H A Version 6.06P 26342

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QUALITY CONTROL AND DATING CHECK OF TREE-RING MEASUREMENTS

Title of run: Appalachian Gap Corr5-30

File of DATED series: appgap\_compact\_corr5.dta

CONTENTS:

Part 1: Title page, options selected, summary, absent rings by series

Part 2: Histogram of time spans

Part 3: Master series with sample depth and absent rings by year

Part 4: Bar plot of Master Dating Series

Part 5: Correlation by segment of each series with Master

Part 6: Potential problems: low correlation, divergent year-to-year changes, absent rings, outliers

Part 7: Descriptive statistics

RUN CONTROL OPTIONS SELECTED VALUE

1 Cubic smoothing spline 50% wavelength cutoff for filtering

32 years

2 Segments examined are 30 years lagged successively by 15 years

3 Autoregressive model applied A Residuals are used in master dating series and testing

4 Series transformed to logarithms Y Each series log-transformed for master dating series and testing

5 CORRELATION is Pearson (parametric, quantitative)

Critical correlation, 99% confidence level .4226

6 Master dating series saved N

7 Ring measurements listed Y

8 Parts printed 1234567

9 Absent rings are omitted from master series and segment correlations (Y)

Time span of Master dating series is 1900 to 2006 107 years

Continuous time span is 1900 to 2006 107 years

Portion with two or more series is 1907 to 2006 100 years

>> 81a 2004 absent in 17 of 40 series, but is not usually narrow: master index is .277

>> 81a 2005 absent in 24 of 40 series, but is not usually narrow: master index is .554

>> 81a 2006 absent in 28 of 40 series, but is not usually narrow: master index is .635

>> 81b 2004 absent in 17 of 40 series, but is not usually narrow: master index is .277

>> 81b 2005 absent in 24 of 40 series, but is not usually narrow: master index is .554

>> 81b 2006 absent in 28 of 40 series, but is not usually narrow: master index is .635

>> 82a 2004 absent in 17 of 40 series, but is not usually narrow: master index is .277

>> 82a 2005 absent in 24 of 40 series, but is not usually narrow: master index is .554

>> 82a 2006 absent in 28 of 40 series, but is not usually narrow: master index is .635

>> 82b 2002 absent in 4 of 40 series, but is not usually narrow: master index is .636

>> 82b 2004 absent in 17 of 40 series, but is not usually narrow: master index is .277

>> 82b 2005 absent in 24 of 40 series, but is not usually narrow: master index is .554

>> 82b 2006 absent in 28 of 40 series, but is not usually narrow: master index is .635

>> 83a 2005 absent in 24 of 40 series, but is not usually narrow: master index is .554

>> 83a 2006 absent in 28 of 40 series, but is not usually narrow: master index is .635

>> 83b 2001 absent in 4 of 40 series, but is not usually narrow: master index is -.341

>> 83b 2006 absent in 28 of 40 series, but is not usually narrow: master index is .635

>> 84a 2004 absent in 17 of 40 series, but is not usually narrow: master index is .277

>> 84a 2005 absent in 24 of 40 series, but is not usually narrow: master index is .554

>> 84a 2006 absent in 28 of 40 series, but is not usually narrow: master index is .635

>> 84b 2000 absent in 2 of 40 series, but is not usually narrow: master index is -.329

>> 84b 2004 absent in 17 of 40 series, but is not usually narrow: master index is .277

>> 84b 2005 absent in 24 of 40 series, but is not usually narrow: master index is .554

>> 84b 2006 absent in 28 of 40 series, but is not usually narrow: master index is .635

>> 85a 2001 absent in 4 of 40 series, but is not usually narrow: master index is -.341

>> 85a 2002 absent in 4 of 40 series, but is not usually narrow: master index is .636

>> 85a 2004 absent in 17 of 40 series, but is not usually narrow: master index is .277

>> 85a 2005 absent in 24 of 40 series, but is not usually narrow: master index is .554

>> 85a 2006 absent in 28 of 40 series, but is not usually narrow: master index is .635

>> 85b 2005 absent in 24 of 40 series, but is not usually narrow: master index is .554

>> 85b 2006 absent in 28 of 40 series, but is not usually narrow: master index is .635

>> 86a 2006 absent in 28 of 40 series, but is not usually narrow: master index is .635

>> 86b 2004 absent in 17 of 40 series, but is not usually narrow: master index is .277

>> 86b 2005 absent in 24 of 40 series, but is not usually narrow: master index is .554

>> 86b 2006 absent in 28 of 40 series, but is not usually narrow: master index is .635

>> 87a 2001 absent in 4 of 40 series, but is not usually narrow: master index is -.341

>> 88a 2004 absent in 17 of 40 series, but is not usually narrow: master index is .277

>> 88a 2005 absent in 24 of 40 series, but is not usually narrow: master index is .554

>> 88a 2006 absent in 28 of 40 series, but is not usually narrow: master index is .635

>> 88b 2004 absent in 17 of 40 series, but is not usually narrow: master index is .277

>> 88b 2005 absent in 24 of 40 series, but is not usually narrow: master index is .554

>> 88b 2006 absent in 28 of 40 series, but is not usually narrow: master index is .635

>> 89a 2005 absent in 24 of 40 series, but is not usually narrow: master index is .554

>> 89a 2006 absent in 28 of 40 series, but is not usually narrow: master index is .635

>> 89b 2005 absent in 24 of 40 series, but is not usually narrow: master index is .554

>> 89b 2006 absent in 28 of 40 series, but is not usually narrow: master index is .635

>> 90a 2005 absent in 24 of 40 series, but is not usually narrow: master index is .554

>> 90a 2006 absent in 28 of 40 series, but is not usually narrow: master index is .635

>> 91a 2006 absent in 28 of 40 series, but is not usually narrow: master index is .635

>> 91b 1987 absent in 1 of 40 series, but is not usually narrow: master index is 1.005

>> 91b 2001 absent in 4 of 40 series, but is not usually narrow: master index is -.341

>> 92b 1974 absent in 1 of 40 series, but is not usually narrow: master index is -.009

>> 92b 2002 absent in 4 of 40 series, but is not usually narrow: master index is .636

>> 92b 2005 absent in 24 of 40 series, but is not usually narrow: master index is .554

>> 94a 2005 absent in 24 of 40 series, but is not usually narrow: master index is .554

>> 94a 2006 absent in 28 of 40 series, but is not usually narrow: master index is .635

>> 94b 2005 absent in 24 of 40 series, but is not usually narrow: master index is .554

>> 94b 2006 absent in 28 of 40 series, but is not usually narrow: master index is .635

>> 95a 2004 absent in 17 of 40 series, but is not usually narrow: master index is .277

>> 95a 2005 absent in 24 of 40 series, but is not usually narrow: master index is .554

>> 95a 2006 absent in 28 of 40 series, but is not usually narrow: master index is .635

>> 95b 2004 absent in 17 of 40 series, but is not usually narrow: master index is .277

>> 95b 2005 absent in 24 of 40 series, but is not usually narrow: master index is .554

>> 95b 2006 absent in 28 of 40 series, but is not usually narrow: master index is .635

>> 96b 2004 absent in 17 of 40 series, but is not usually narrow: master index is .277

>> 97a 2005 absent in 24 of 40 series, but is not usually narrow: master index is .554

>> 97a 2006 absent in 28 of 40 series, but is not usually narrow: master index is .635

>> 97b 2002 absent in 4 of 40 series, but is not usually narrow: master index is .636

>> 97b 2004 absent in 17 of 40 series, but is not usually narrow: master index is .277

>> 97b 2005 absent in 24 of 40 series, but is not usually narrow: master index is .554

>> 97b 2006 absent in 28 of 40 series, but is not usually narrow: master index is .635

>> 98a 1999 absent in 1 of 40 series, but is not usually narrow: master index is .295

>> 98a 2006 absent in 28 of 40 series, but is not usually narrow: master index is .635

>> 98b 2000 absent in 2 of 40 series, but is not usually narrow: master index is -.329

>> 98b 2004 absent in 17 of 40 series, but is not usually narrow: master index is .277

>> 98b 2006 absent in 28 of 40 series, but is not usually narrow: master index is .635

>> 100a 2004 absent in 17 of 40 series, but is not usually narrow: master index is .277

>> 100a 2005 absent in 24 of 40 series, but is not usually narrow: master index is .554

>> 100a 2006 absent in 28 of 40 series, but is not usually narrow: master index is .635

>> 100b 2004 absent in 17 of 40 series, but is not usually narrow: master index is .277

>> 100b 2005 absent in 24 of 40 series, but is not usually narrow: master index is .554

>> 100b 2006 absent in 28 of 40 series, but is not usually narrow: master index is .635

ABSENT RINGS listed by SERIES: (See Master Dating Series for absent rings listed by year)

81a 3 absent rings: 2004 2005 2006

81b 3 absent rings: 2004 2005 2006

82a 4 absent rings: 2003 2004 2005 2006

82b 5 absent rings: 2002 2003 2004 2005 2006

83a 3 absent rings: 1945 2005 2006

83b 3 absent rings: 1945 2001 2006

84a 4 absent rings: 2003 2004 2005 2006

84b 5 absent rings: 2000 2003 2004 2005 2006

85a 6 absent rings: 2001 2002 2003 2004 2005 2006

85b 2 absent rings: 2005 2006

86a 1 absent rings: 2006

86b 3 absent rings: 2004 2005 2006

87a 1 absent rings: 2001

88a 4 absent rings: 2003 2004 2005 2006

88b 4 absent rings: 2003 2004 2005 2006

89a 2 absent rings: 2005 2006

89b 2 absent rings: 2005 2006

90a 2 absent rings: 2005 2006

91a 2 absent rings: 2003 2006

91b 2 absent rings: 1987 2001

92a 1 absent rings: 2003

92b 5 absent rings: 1974 1979 2002 2003 2005

94a 3 absent rings: 2003 2005 2006

94b 2 absent rings: 2005 2006

95a 4 absent rings: 2003 2004 2005 2006

95b 4 absent rings: 2003 2004 2005 2006

96a 1 absent rings: 1946

96b 2 absent rings: 2003 2004

97a 2 absent rings: 2005 2006

97b 6 absent rings: 1948 2002 2003 2004 2005 2006

98a 2 absent rings: 1999 2006

98b 4 absent rings: 1945 2000 2004 2006

100a 4 absent rings: 2003 2004 2005 2006

100b 4 absent rings: 2003 2004 2005 2006

105 absent rings 3.063%

Year Value No Ab Year Value No Ab Year Value No Ab Year Value No Ab Year Value No Ab Year Value No Ab

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1900 .545 1 1950 -.054 39 2000 -.329 40 2<<

1901 2.913 1 1951 .571 39 2001 -.341 40 4<<

1902 1.477 1 1952 .409 39 2002 .636 40 4<<

1903 .230 1 1953 -2.126 39 2003 -1.664 40 17

1904 .117 1 1954 -.202 40 2004 .277 40 17<<

1905 -.445 1 1955 1.318 40 2005 .554 40 24<<

1906 -1.710 1 1956 1.453 40 2006 .635 40 28<<

1907 -.359 2 1957 .263 40

1908 -1.900 2 1958 -.012 40

1909 -2.535 3 1959 .340 40

1910 -.849 4 1960 .084 40

1911 -.316 8 1961 1.143 40

1912 -.213 10 1962 -.775 40

1913 -.549 13 1963 .541 40

1914 .444 15 1964 .199 40

1915 .886 19 1965 .582 40

1916 -.029 20 1966 -1.027 40

1917 -.317 20 1967 .959 40

1918 .845 21 1968 -.287 40

1919 .096 21 1969 .916 40

1920 .814 22 1970 -.305 40

1921 -.876 25 1971 .546 40

1922 -.013 25 1972 .219 40

1923 -1.506 26 1973 .804 40

1924 -1.414 26 1974 -.009 40 1<<

1925 .568 26 1975 -3.079 40

1926 .150 30 1976 .116 40

1927 1.274 30 1977 .319 40

1928 1.006 30 1978 .908 40

1929 1.217 30 1979 -1.048 40 1

1930 .946 32 1980 -1.020 40

1931 .308 34 1981 .116 40

1932 -1.442 34 1982 .915 40

1933 -1.532 34 1983 -1.091 40

1934 -.127 34 1984 -.553 40

1935 .678 34 1985 -1.330 40

1936 -.540 34 1986 .248 40

1937 .266 34 1987 1.005 40 1<<

1938 -.605 34 1988 .184 40

1939 .399 35 1989 -1.009 40

1940 .963 36 1990 .204 40

1941 .506 36 1991 .464 40

1942 .384 37 1992 -.389 40

1943 1.334 37 1993 -.553 40

1944 .661 38 1994 1.200 40

1945 -2.631 38 3 1995 .240 40

1946 -2.045 39 1 1996 .379 40

1947 .468 39 1997 1.581 40

1948 -1.163 39 1 1998 1.313 40

1949 -1.111 39 1999 .295 40 1<<

PART 5: CORRELATION OF SERIES BY SEGMENTS: Appalachian Gap Corr5-30 10:35 Mon 12 Feb 2007 Page 5

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Correlations of 30-year dated segments, lagged 15 years

Flags: A = correlation under .4226 but highest as dated; B = correlation higher at other than dated position

Seq Series Time\_span 1905 1920 1935 1950 1965 1980

1934 1949 1964 1979 1994 2009

--- -------- --------- ---- ---- ---- ---- ---- ---- ---- ---- ---- ---- ---- ---- ---- ---- ---- ---- ---- ---- ---- ----

1 81a 1900 2006 .44 .58 .47 .50B .46 .52

2 81b 1916 2006 .37A .43B .36B .50 .52 .61

3 82a 1909 2006 .51 .49 .44 .40A .48 .59

4 82b 1907 2006 .39A .40A .40A .47 .48 .55

5 83a 1918 2006 .51 .60 .52B .56 .55 .55

6 83b 1913 2006 .67 .66 .36A .46 .48 .50

7 84a 1914 2006 .49 .47 .37A .69 .83 .71

8 84b 1912 2006 .48 .44 .54 .72 .56 .30B

9 85a 1915 2006 .74 .81 .63 .43 .54 .49

10 85b 1910 2006 .07B .17B .19B .58 .61 .46

11 86a 1914 2006 .40A .64 .67 .49 .35B .23B

12 86b 1911 2006 .00B .44 .53 .50 .39A .09B

13 87a 1913 2006 .65 .82 .80 .61 .61 .57

14 87b 1913 2006 .43B .66 .86 .90 .62 .44

15 88a 1911 2006 .50 .71 .66 .54 .54 .53

16 88b 1915 2006 .50 .52 .53 .50 .27B .07B

17 89a 1912 2006 .48 .65 .80 .73 .65 .74

18 89b 1915 2006 .51 .63 .81 .82 .61 .49

19 90a 1911 2006 .45 .67 .76 .55 .47 .54

20 90b 1911 2006 .46 .61 .69 .54 .49 .59

21 91a 1939 2006 .74 .72 .61 .23B

22 91b 1930 2006 .65 .66 .63 .55 .43

23 92a 1942 2006 .38B .29B .28B .70

24 92b 1921 2006 .57 .71 .47 .38A .39A

25 93a 1946 2006 .75 .78 .84 .70

26 93b 1940 2006 .55 .61 .55 .60

27 94a 1944 2006 .57 .72 .49 .22B

28 94b 1954 2006 .70 .63 .36A

29 95a 1926 2006 .67 .65 .34B .30B .57

30 95b 1923 2006 .42 .69 .58 .39B .36B

31 96a 1915 2006 .45 .57 .64 .67 .61 .68

32 96b 1926 2006 .72 .66 .79 .71 .52

33 97a 1926 2006 .50 .42A .41A .46B .53

34 97b 1920 2006 .61 .53 .55 .48B .50

35 98a 1931 2006 .76 .68 .42 .49 .76

36 98b 1930 2006 .30B .30B .37B .55 .49

37 99a 1921 2006 .69 .67 .50 .57 .75

38 99b 1931 2006 .63 .82 .67 .60 .53

39 100a 1926 2006 .42A .55 .76 .71 .66

40 100b 1921 2006 .41B .56 .72 .61 .52

Av segment correlation .45 .57 .59 .58 .53 .50

81a 1900 to 2006 107 years Series 1

[\*] Early part of series cannot be checked from 1900 to 1906 -- not matched by another series

[A] Segment High -10 -9 -8 -7 -6 -5 -4 -3 -2 -1 +0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10

--------- ---- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- ---

1950 1979 -4 -.30 .16 -.02 -.13 -.25 .04 .65\*-.30 -.09 -.42 .50|-.09 -.06 -.04 .26 -.03 .14 -.26 -.14 .11 .15

[B] Entire series, effect on correlation ( .429) is:

Lower 1909> -.034 1957< -.015 1939< -.011 2003> -.011 1972< -.010 1980< -.009 Higher 1997 .016 1955 .012

1950 to 1979 segment:

Lower 1975> -.067 1957< -.030 1972< -.021 1970> -.018 1968> -.018 1965< -.016 Higher 1955 .027 1979 .026

[D] 3 Absent rings: Year Master N series Absent

2004 .277 40 17 >> WARNING: Ring is not usually narrow

2005 .554 40 24 >> WARNING: Ring is not usually narrow

2006 .635 40 28 >> WARNING: Ring is not usually narrow

>> WARNING: Last ring in series is ABSENT

[E] Outliers 1 3.0 SD above or -4.5 SD below mean for year

1980 -6.4 SD

81a Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1900 57 140 87 53 52 41 18 18 13 43

1910 6 46 31 94 140 205 190 232 221 185

1920 185 108 156 100 121 143 160 176 182 185

1930 159 108 97 73 87 97 94 118 107 78

1940 88 114 114 132 93 72 57 67 75 63

1950 57 103 106 67 80 123 89 33 30 53

1960 67 105 53 74 42 32 32 88 84 92

1970 92 108 52 65 62 46 69 55 69 27

1980 13 28 47 41 49 46 36 54 54 34

1990 34 42 31 27 55 40 39 86 61 66

2000 13 11 6 10 0 0 0

====================================================================================================================================

81b 1916 to 2006 91 years Series 2

[A] Segment High -10 -9 -8 -7 -6 -5 -4 -3 -2 -1 +0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10

--------- ---- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- ---

1916 1945 0 .13 .18 -.07 -.17 -.37 -.19 -.06 -.11 .19 .25 .37\*-.05 -.01 .01 -.10 -.10 -.36 -.23 .09 -.09 -.22

1920 1949 -1 .17 .08 .13 -.18 -.40 -.15 -.08 -.19 .05 .52\* .43|-.15 .13 .09 -.17 -.12 -.22 .12 .05 -.21 -.31

1935 1964 -1 -.04 .04 .21 -.03 -.19 .08 .09 -.23 -.04 .39\* .36|-.24 .01 -.15 .07 -.08 -.05 .11 .08 -.17 -.30

[B] Entire series, effect on correlation ( .455) is:

Lower 1975> -.049 1945> -.039 1938> -.015 1937< -.011 1964< -.009 1940< -.008 Higher 1953 .029 1979 .018

1916 to 1945 segment:

Lower 1945> -.101 1937< -.053 1938> -.047 1940< -.039 1917> -.017 1936> -.017 Higher 1927 .053 1932 .044

1920 to 1949 segment:

Lower 1945> -.103 1938> -.034 1937< -.032 1940< -.025 1949> -.017 1936> -.015 Higher 1927 .038 1943 .028

1935 to 1964 segment:

Lower 1945> -.104 1938> -.037 1937< -.023 1949> -.020 1964< -.019 1940< -.018 Higher 1953 .091 1946 .078

[D] 3 Absent rings: Year Master N series Absent

2004 .277 40 17 >> WARNING: Ring is not usually narrow

2005 .554 40 24 >> WARNING: Ring is not usually narrow

2006 .635 40 28 >> WARNING: Ring is not usually narrow

>> WARNING: Last ring in series is ABSENT

[E] Outliers 2 3.0 SD above or -4.5 SD below mean for year

1945 +3.3 SD; 1975 +3.5 SD

81b Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1916 146 163 158 127

1920 157 114 145 136 123 147 166 243 210 191

1930 179 166 118 103 115 117 132 93 142 126

1940 99 105 92 124 135 104 53 78 66 79

1950 85 72 69 49 53 60 74 64 51 62

1960 76 78 69 100 56 53 31 79 64 95

1970 86 100 79 110 115 96 98 93 102 46

1980 39 53 62 53 63 33 42 45 44 45

1990 53 59 30 31 72 45 24 56 53 52

2000 4 18 7 5 0 0 0

====================================================================================================================================

82a 1909 to 2006 98 years Series 3

[A] Segment High -10 -9 -8 -7 -6 -5 -4 -3 -2 -1 +0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10

--------- ---- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- ---

1950 1979 0 -.46 .04 .06 -.11 -.08 .14 .38 -.31 .19 -.29 .40\*-.14 .01 -.11 .18 -.03 -.04 -.34 -.20 .08 .00

[B] Entire series, effect on correlation ( .450) is:

Lower 1975> -.051 1932> -.023 1945> -.022 1917< -.019 1950< -.016 1926< -.009 Higher 2003 .017 1933 .013

1950 to 1979 segment:

Lower 1975> -.152 1950< -.072 1961< -.028 1963< -.012 1960< -.012 1957> -.010 Higher 1979 .041 1956 .035

[D] 4 Absent rings: Year Master N series Absent

2003 -1.664 40 17

2004 .277 40 17 >> WARNING: Ring is not usually narrow

2005 .554 40 24 >> WARNING: Ring is not usually narrow

2006 .635 40 28 >> WARNING: Ring is not usually narrow

>> WARNING: Last ring in series is ABSENT

[E] Outliers 1 3.0 SD above or -4.5 SD below mean for year

1950 -4.6 SD

82a Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1909 28

1910 41 100 81 83 100 141 129 51 175 132

1920 189 117 173 103 74 123 73 181 180 196

1930 177 104 131 49 58 183 86 51 47 80

1940 84 86 91 71 50 54 50 139 78 18

1950 13 78 82 55 60 149 210 160 120 125

1960 68 81 74 103 92 117 103 268 189 214

1970 123 130 161 205 138 144 301 160 124 71

1980 77 65 108 83 35 30 97 151 101 38

1990 111 62 17 35 58 28 21 75 45 30

2000 29 51 62 0 0 0 0

====================================================================================================================================

82b 1907 to 2006 100 years Series 4

[A] Segment High -10 -9 -8 -7 -6 -5 -4 -3 -2 -1 +0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10

--------- ---- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- ---

1907 1936 0 - - - -.18 -.20 -.13 -.09 .22 .27 .26 .39\*-.07 -.07 -.30 -.07 .03 -.26 -.01 -.05 .21 .03

1920 1949 0 .07 -.34 -.36 -.24 -.29 .10 .08 .28 .13 .21 .40\*-.20 -.21 -.27 .06 -.08 -.45 .09 .12 .21 .13

1935 1964 0 -.28 -.17 -.14 -.16 -.13 .19 .38 .00 -.14 .00 .40\*-.15 -.14 -.17 .30 -.14 -.35 -.01 .16 .06 .14

[B] Entire series, effect on correlation ( .405) is:

Lower 1945> -.042 1910> -.025 1932> -.023 2002< -.016 1975> -.014 1921> -.011 Higher 1983 .017 1909 .013

1907 to 1936 segment:

Lower 1910> -.081 1932> -.073 1934< -.040 1917< -.036 1921> -.033 1912< -.027 Higher 1909 .056 1933 .038

1920 to 1949 segment:

Lower 1945> -.148 1932> -.071 1921> -.034 1934< -.031 1941< -.024 1944< -.007 Higher 1933 .037 1927 .030

1935 to 1964 segment:

Lower 1945> -.188 1964< -.027 1953> -.020 1941< -.020 1950< -.016 1952< -.009 Higher 1956 .038 1955 .033

[D] 5 Absent rings: Year Master N series Absent

2002 .636 40 4 >> WARNING: Ring is not usually narrow

2003 -1.664 40 17

2004 .277 40 17 >> WARNING: Ring is not usually narrow

2005 .554 40 24 >> WARNING: Ring is not usually narrow

2006 .635 40 28 >> WARNING: Ring is not usually narrow

>> WARNING: Last ring in series is ABSENT

82b Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1907 86 28 17

1910 121 107 39 105 115 171 116 48 107 135

1920 189 162 120 80 85 153 119 175 141 169

1930 202 157 142 33 31 97 54 71 32 73

1940 140 54 82 85 57 83 60 131 59 18

1950 34 120 75 58 57 125 165 92 89 120

1960 95 139 91 96 69 98 91 191 168 246

1970 162 134 78 195 137 99 184 101 136 95

1980 100 75 92 41 55 100 95 107 92 62

1990 90 85 36 77 120 82 21 62 90 49

2000 8 16 0 0 0 0 0

====================================================================================================================================

83a 1918 to 2006 89 years Series 5

[A] Segment High -10 -9 -8 -7 -6 -5 -4 -3 -2 -1 +0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10

--------- ---- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- ---

1935 1964 -4 -.16 .18 .01 -.13 -.32 .03 .53\* .18 -.21 -.01 .52|-.34 -.19 .02 .13 -.02 -.23 -.25 .14 -.04 .01

[B] Entire series, effect on correlation ( .598) is:

Lower 1920< -.022 1953> -.020 1968> -.016 1985> -.014 1919> -.012 2005< -.011 Higher 1945 .067 1975 .030

1935 to 1964 segment:

Lower 1953> -.071 1957< -.018 1956< -.015 1946> -.013 1948> -.009 1938> -.007 Higher 1945 .169 1961 .016

[D] 3 Absent rings: Year Master N series Absent

1945 -2.631 38 3

2005 .554 40 24 >> WARNING: Ring is not usually narrow

2006 .635 40 28 >> WARNING: Ring is not usually narrow

>> WARNING: Last ring in series is ABSENT

[E] Outliers 1 3.0 SD above or -4.5 SD below mean for year

1945 -4.7 SD

83a Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1918 136 278

1920 53 17 142 123 80 211 195 213 231 235

1930 148 88 40 57 50 87 63 116 94 132

1940 107 82 111 112 144 0 59 133 88 68

1950 81 138 129 120 109 156 141 101 163 172

1960 145 235 157 168 178 197 170 176 203 212

1970 155 160 174 143 108 53 85 60 88 59

1980 70 91 101 24 40 72 107 70 57 65

1990 75 93 76 30 34 44 36 68 55 15

2000 7 5 38 3 25 0 0

====================================================================================================================================

83b 1913 to 2006 94 years Series 6

[A] Segment High -10 -9 -8 -7 -6 -5 -4 -3 -2 -1 +0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10

--------- ---- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- ---

1935 1964 0 -.26 .16 .14 -.19 .01 .12 .15 -.14 .03 .24 .36\*-.38 -.32 .03 .17 .04 -.23 -.13 .22 -.04 -.12

[B] Entire series, effect on correlation ( .572) is:

Lower 1985> -.027 1954< -.024 1946> -.013 1962> -.012 1972> -.010 1989> -.009 Higher 1945 .074 1983 .014

1935 to 1964 segment:

Lower 1954< -.057 1946> -.036 1962> -.032 1953> -.022 1940< -.019 1958> -.012 Higher 1945 .250 1956 .014

[D] 3 Absent rings: Year Master N series Absent

1945 -2.631 38 3

2001 -.341 40 4 >> WARNING: Ring is not usually narrow

2006 .635 40 28 >> WARNING: Ring is not usually narrow

>> WARNING: Last ring in series is ABSENT

83b Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1913 66 97 165 171 95 133 133

1920 188 59 154 106 46 198 153 187 158 140

1930 93 53 18 28 39 63 50 69 38 77

1940 45 36 54 58 67 0 36 63 46 37

1950 39 70 96 56 17 91 119 95 129 83

1960 78 116 110 95 69 79 83 93 102 126

1970 102 115 196 178 139 71 111 114 116 60

1980 53 68 92 24 24 99 81 80 91 87

1990 96 92 99 55 77 64 91 116 83 27

2000 23 0 29 10 3 5 0

====================================================================================================================================

84a 1914 to 2006 93 years Series 7

[A] Segment High -10 -9 -8 -7 -6 -5 -4 -3 -2 -1 +0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10

--------- ---- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- ---

1935 1964 0 -.17 -.08 -.12 -.10 .02 .24 -.12 -.13 .15 .21 .37\* .14 .20 .08 .14 -.22 -.05 .03 .19 -.37 -.34

[B] Entire series, effect on correlation ( .612) is:

Lower 1953> -.027 1922< -.020 1932> -.019 1936> -.019 1945> -.015 1947< -.014 Higher 1975 .069 2003 .013

1935 to 1964 segment:

Lower 1947< -.067 1936> -.061 1951< -.053 1950< -.042 1953> -.039 1960< -.013 Higher 1945 .069 1946 .053

[D] 4 Absent rings: Year Master N series Absent

2003 -1.664 40 17

2004 .277 40 17 >> WARNING: Ring is not usually narrow

2005 .554 40 24 >> WARNING: Ring is not usually narrow

2006 .635 40 28 >> WARNING: Ring is not usually narrow

>> WARNING: Last ring in series is ABSENT

84a Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1914 322 290 267 203 271 192

1920 231 153 91 94 82 123 137 142 142 179

1930 152 152 149 99 126 171 193 139 120 165

1940 164 145 120 148 115 76 52 47 49 87

1950 51 49 96 121 184 214 221 209 142 172

1960 126 160 160 197 193 175 151 194 116 197

1970 145 155 154 137 104 46 116 105 110 71

1980 65 104 122 95 71 28 102 113 106 34

1990 64 64 58 47 59 49 29 64 76 57

2000 9 16 50 0 0 0 0

====================================================================================================================================

84b 1912 to 2006 95 years Series 8

[A] Segment High -10 -9 -8 -7 -6 -5 -4 -3 -2 -1 +0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10

--------- ---- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- ---

1977 2006 -10 .37\*-.08 .00 -.20 .25 -.01 .27 -.17 -.14 .32 .30| - - - - - - - - - -

[B] Entire series, effect on correlation ( .544) is:

Lower 1983> -.026 1974< -.019 1979> -.015 1937< -.014 1945> -.010 1921> -.009 Higher 1975 .064 1953 .014

1977 to 2006 segment:

Lower 1983> -.092 1979> -.045 1996< -.039 1987< -.030 1980> -.020 1992> -.011 Higher 1997 .081 1989 .059

[D] 5 Absent rings: Year Master N series Absent

2000 -.329 40 2 >> WARNING: Ring is not usually narrow

2003 -1.664 40 17

2004 .277 40 17 >> WARNING: Ring is not usually narrow

2005 .554 40 24 >> WARNING: Ring is not usually narrow

2006 .635 40 28 >> WARNING: Ring is not usually narrow

>> WARNING: Last ring in series is ABSENT

84b Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1912 290 260 282 289 241 227 318 229

1920 269 238 212 111 147 200 135 160 211 206

1930 195 220 148 141 152 148 143 99 128 159

1940 192 103 98 123 140 89 67 102 97 87

1950 59 62 92 54 82 149 148 115 117 121

1960 87 99 53 94 98 100 63 83 74 101

1970 82 99 82 112 44 25 64 96 88 85

1980 87 66 105 95 81 61 67 55 58 35

1990 48 55 55 27 47 49 20 72 55 51

2000 0 10 15 0 0 0 0

====================================================================================================================================

85a 1915 to 2006 92 years Series 9

[B] Entire series, effect on correlation ( .585) is:

Lower 1951< -.041 1983> -.018 1966> -.014 1953> -.014 1998< -.013 2003> -.012 Higher 1945 .063 1923 .014

[D] 6 Absent rings: Year Master N series Absent

2001 -.341 40 4 >> WARNING: Ring is not usually narrow

2002 .636 40 4 >> WARNING: Ring is not usually narrow

2003 -1.664 40 17

2004 .277 40 17 >> WARNING: Ring is not usually narrow

2005 .554 40 24 >> WARNING: Ring is not usually narrow

2006 .635 40 28 >> WARNING: Ring is not usually narrow

>> WARNING: Last ring in series is ABSENT

85a Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1915 286 193 271 294 190

1920 281 264 223 121 176 271 328 391 385 351

1930 301 327 189 166 252 243 231 270 184 204

1940 186 214 195 210 196 54 87 156 107 151

1950 150 62 127 115 108 161 160 78 97 138

1960 141 284 139 184 148 136 144 188 107 108

1970 80 70 61 61 48 27 48 75 72 33

1980 16 50 82 69 80 14 55 83 64 55

1990 21 24 14 11 72 40 12 37 8 3

2000 4 0 0 0 0 0 0

====================================================================================================================================

85b 1910 to 2006 97 years Series 10

[A] Segment High -10 -9 -8 -7 -6 -5 -4 -3 -2 -1 +0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10

--------- ---- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- ---

1910 1939 -10 .66\* .24 .25 .05 .04 -.35 -.25 -.04 -.04 -.10 .07| .02 .14 .08 .38 .27 -.24 .06 -.35 -.22 -.26

1920 1949 3 .52 .37 -.09 -.39 -.11 -.37 -.02 .03 .03 .16 .17|-.02 -.07 .54\* .34 -.17 -.01 -.05 -.28 -.28 -.11

1935 1964 3 .21 .26 -.16 -.41 -.07 -.04 .08 -.04 -.10 .01 .19|-.21 -.14 .66\* .36 -.13 .12 .01 -.16 -.16 -.12

[B] Entire series, effect on correlation ( .276) is:

Lower 1942< -.043 1919< -.032 1953> -.024 2005< -.017 1911> -.016 1924> -.014 Higher 1975 .037 1985 .024

1910 to 1939 segment:

Lower 1919< -.048 1911> -.043 1924> -.038 1913> -.016 1938> -.014 1923> -.012 Higher 1927 .055 1933 .042

1920 to 1949 segment:

Lower 1942< -.204 1924> -.037 1947< -.029 1938> -.013 1934< -.013 1923> -.013 Higher 1927 .048 1945 .044

1935 to 1964 segment:

Lower 1942< -.170 1953> -.063 1959< -.029 1947< -.026 1938> -.015 1950< -.010 Higher 1955 .047 1945 .039

[D] 2 Absent rings: Year Master N series Absent

2005 .554 40 24 >> WARNING: Ring is not usually narrow

2006 .635 40 28 >> WARNING: Ring is not usually narrow

>> WARNING: Last ring in series is ABSENT

[E] Outliers 1 3.0 SD above or -4.5 SD below mean for year

1942 -6.4 SD

85b Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1910 235 314 216 241 268 251 169 184 241 168

1920 211 253 232 240 293 249 284 327 305 229

1930 294 281 221 165 174 220 221 328 268 235

1940 248 179 26 173 242 143 131 115 100 107

1950 100 227 337 227 175 265 197 111 124 88

1960 134 234 140 114 161 119 75 122 98 168

1970 111 102 92 157 146 59 106 110 114 54

1980 65 71 86 88 75 26 51 80 96 79

1990 74 55 24 56 87 60 22 56 39 8

2000 7 32 19 7 23 0 0

====================================================================================================================================

86a 1914 to 2006 93 years Series 11

[A] Segment High -10 -9 -8 -7 -6 -5 -4 -3 -2 -1 +0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10

--------- ---- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- ---

1914 1943 0 -.10 -.07 .00 -.09 .03 .25 .16 .06 -.20 -.42 .40\*-.02 .18 -.05 .03 -.14 -.26 .07 -.02 .37 .20

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

1965 1994 -10 .48\*-.18 .14 -.24 .25 -.12 .08 -.20 .20 .06 .35|-.47 -.19 -.05 .25 -.06 -.16 .00 .16 -.04 -.08

1977 2006 -10 .59\*-.36 .23 -.15 .29 -.08 .02 -.10 .21 .00 .23| - - - - - - - - - -

[B] Entire series, effect on correlation ( .484) is:

Lower 1987< -.029 1979> -.028 1953> -.017 1923> -.012 1914< -.011 1961< -.010 Higher 1945 .087 1975 .022

1914 to 1943 segment:

Lower 1923> -.056 1914< -.047 1933> -.039 1924> -.038 1935< -.019 1915< -.016 Higher 1932 .049 1927 .039

1965 to 1994 segment:

Lower 1987< -.088 1979> -.077 1992> -.018 1971< -.018 1986< -.015 1974> -.014 Higher 1975 .111 1985 .055

1977 to 2006 segment:

Lower 1987< -.090 1979> -.090 1992> -.023 2005< -.019 2000> -.018 1996< -.017 Higher 1985 .157 1997 .038

[D] 1 Absent rings: Year Master N series Absent

2006 .635 40 28 >> WARNING: Ring is not usually narrow

>> WARNING: Last ring in series is ABSENT

[E] Outliers 1 3.0 SD above or -4.5 SD below mean for year

1945 -5.2 SD

86a Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1914 19 68 90 85 265 107

1920 248 127 262 214 223 350 253 292 191 190

1930 159 144 109 153 204 128 53 90 81 122

1940 151 100 115 131 111 13 91 169 117 89

1950 118 145 146 141 242 258 256 140 151 146

1960 173 132 100 196 171 170 108 149 112 137

1970 123 110 132 248 196 82 104 153 129 150

1980 117 102 109 81 98 40 56 43 65 53

1990 61 50 56 26 39 35 17 38 31 23

2000 28 3 22 4 22 2 0

====================================================================================================================================

86b 1911 to 2006 96 years Series 12

[A] Segment High -10 -9 -8 -7 -6 -5 -4 -3 -2 -1 +0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10

--------- ---- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- ---

1911 1940 -6 .17 .00 .09 .01 .38\* .23 .08 -.18 -.12 .23 .00|-.05 -.23 -.03 -.15 -.07 -.06 .36 .38 .24 -.24

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

1965 1994 0 .35 -.15 .08 .02 .04 -.13 -.10 -.12 .20 .11 .39\*-.30 .01 -.14 .23 .00 -.17 -.01 .29 -.09 .11

1977 2006 -10 .56\*-.38 .20 .00 .22 -.21 -.04 -.01 .29 .14 .09| - - - - - - - - - -

[B] Entire series, effect on correlation ( .323) is:

Lower 1979> -.041 1987< -.028 1932> -.015 1914< -.014 1989> -.014 1921> -.014 Higher 1975 .119 1985 .021

1911 to 1940 segment:

Lower 1914< -.060 1921> -.052 1932> -.047 1937< -.040 1915< -.036 1918< -.035 Higher 1938 .071 1928 .063

1965 to 1994 segment:

Lower 1979> -.109 1987< -.066 1989> -.040 1983> -.035 1976< -.032 1980> -.013 Higher 1975 .308 1985 .048

1977 to 2006 segment:

Lower 1979> -.118 1987< -.065 1989> -.040 2004< -.027 1983> -.024 2000> -.022 Higher 1985 .214 1994 .066

[D] 3 Absent rings: Year Master N series Absent

2004 .277 40 17 >> WARNING: Ring is not usually narrow

2005 .554 40 24 >> WARNING: Ring is not usually narrow

2006 .635 40 28 >> WARNING: Ring is not usually narrow

>> WARNING: Last ring in series is ABSENT

86b Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1911 357 262 222 4 10 21 26 28 61

1920 65 124 111 82 95 91 125 114 186 142

1930 136 143 130 89 102 146 105 60 40 75

1940 87 111 71 121 139 80 67 99 52 63

1950 144 157 114 83 207 206 222 238 176 164

1960 162 170 177 148 184 172 138 154 133 139

1970 112 121 144 116 113 56 55 73 67 111

1980 87 64 53 56 57 25 45 27 46 48

1990 39 31 28 13 40 28 19 29 41 17

2000 26 9 13 9 0 0 0

====================================================================================================================================

87a 1913 to 2006 94 years Series 13

[B] Entire series, effect on correlation ( .662) is:

Lower 1932> -.027 2001< -.023 1953> -.016 1961< -.013 1973< -.012 1983> -.011 Higher 1945 .044 1946 .009

[D] 1 Absent rings: Year Master N series Absent

2001 -.341 40 4 >> WARNING: Ring is not usually narrow

87a Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1913 122 143 203 172 196 255 153

1920 203 138 143 140 158 203 199 233 206 176

1930 182 148 171 116 141 156 119 129 110 156

1940 186 150 129 218 178 68 68 158 135 149

1950 150 203 173 141 210 236 241 182 145 165

1960 146 135 110 175 145 147 126 187 119 137

1970 117 137 155 109 121 86 119 200 156 95

1980 68 87 112 87 74 48 63 57 72 39

1990 43 65 42 17 58 54 39 63 49 37

2000 13 0 39 34 46 65 68

====================================================================================================================================

87b 1913 to 2006 94 years Series 14

[A] Segment High -10 -9 -8 -7 -6 -5 -4 -3 -2 -1 +0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10

--------- ---- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- ---

1913 1942 10 -.09 -.41 -.23 -.12 -.08 .26 .14 .02 .30 .03 .43| .02 .06 -.12 -.43 -.28 -.39 .28 .01 .19 .44\*

[B] Entire series, effect on correlation ( .667) is:

Lower 1932> -.044 1985> -.023 1981< -.018 1983> -.012 1925< -.010 1984> -.009 Higher 1945 .038 1975 .031

1913 to 1942 segment:

Lower 1932> -.194 1925< -.038 1914< -.029 1931< -.025 1924> -.020 1933> -.010 Higher 1923 .089 1921 .053

[E] Outliers 1 3.0 SD above or -4.5 SD below mean for year

1932 +3.0 SD

87b Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1913 167 166 224 212 205 319 224

1920 323 140 184 129 195 166 198 228 198 243

1930 255 141 254 172 179 171 140 164 117 150

1940 226 168 167 216 172 95 87 214 144 165

1950 190 188 203 150 196 249 245 188 238 224

1960 214 258 184 240 212 223 167 259 176 209

1970 203 227 190 173 147 115 149 138 148 106

1980 99 93 138 119 143 134 126 131 115 82

1990 78 80 70 35 87 59 73 122 46 26

2000 13 4 28 15 56 45 34

====================================================================================================================================

88a 1911 to 2006 96 years Series 15

[B] Entire series, effect on correlation ( .555) is:

Lower 1920< -.033 1973< -.024 1966> -.020 1951< -.016 1988> -.013 1999> -.011 Higher 1975 .038 1945 .025

[D] 4 Absent rings: Year Master N series Absent

2003 -1.664 40 17

2004 .277 40 17 >> WARNING: Ring is not usually narrow

2005 .554 40 24 >> WARNING: Ring is not usually narrow

2006 .635 40 28 >> WARNING: Ring is not usually narrow

>> WARNING: Last ring in series is ABSENT

88a Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1911 126 154 222 322 258 170 242 146 180

1920 65 50 157 114 94 228 201 285 337 324

1930 222 198 118 114 159 199 187 165 151 181

1940 228 227 193 241 242 117 123 197 82 134

1950 150 94 118 99 163 196 223 117 115 109

1960 140 228 178 265 190 212 209 162 88 99

1970 88 115 73 43 57 28 78 64 64 43

1980 51 48 88 49 61 18 30 56 100 55

1990 49 47 34 46 78 77 32 60 81 153

2000 32 35 75 0 0 0 0

====================================================================================================================================

88b 1915 to 2006 92 years Series 16

[A] Segment High -10 -9 -8 -7 -6 -5 -4 -3 -2 -1 +0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10

--------- ---- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- ---

1965 1994 -6 .23 -.32 -.14 .10 .36\*-.12 -.23 -.41 .24 -.03 .27|-.23 .18 .13 .15 -.07 -.07 .12 .06 .01 .15

1977 2006 -1 .16 -.37 .01 .14 .34 .13 -.28 -.41 .39 .43\* .07| - - - - - - - - - -

[B] Entire series, effect on correlation ( .404) is:

Lower 1920< -.031 1983> -.028 1973< -.015 1949> -.014 1979> -.013 1966> -.012 Higher 1975 .047 1932 .024

1965 to 1994 segment:

Lower 1983> -.092 1973< -.047 1979> -.042 1966> -.037 1989> -.035 1990< -.025 Higher 1975 .235 1994 .042

1977 to 2006 segment:

Lower 1983> -.102 1979> -.037 1989> -.034 1990< -.031 1984> -.024 1988> -.024 Higher 2003 .135 1985 .083

[D] 4 Absent rings: Year Master N series Absent

2003 -1.664 40 17

2004 .277 40 17 >> WARNING: Ring is not usually narrow

2005 .554 40 24 >> WARNING: Ring is not usually narrow

2006 .635 40 28 >> WARNING: Ring is not usually narrow

>> WARNING: Last ring in series is ABSENT

[E] Outliers 1 3.0 SD above or -4.5 SD below mean for year

1921 -4.6 SD

88b Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1915 215 145 262 115 251

1920 73 12 126 109 90 185 123 195 186 164

1930 110 112 65 94 111 138 96 127 88 165

1940 167 172 149 202 206 149 168 238 158 216

1950 210 218 214 161 131 174 189 127 165 216

1960 117 153 102 195 162 136 123 134 55 71

1970 60 60 35 22 13 6 22 32 47 36

1980 19 12 17 41 47 16 26 23 64 48

1990 18 16 25 22 55 68 59 45 46 65

2000 24 5 29 0 0 0 0

====================================================================================================================================

89a 1912 to 2006 95 years Series 17

[B] Entire series, effect on correlation ( .632) is:

Lower 1920< -.030 1968> -.026 2005< -.022 1965< -.018 1966> -.013 1918< -.011 Higher 1975 .062 1953 .030

[D] 2 Absent rings: Year Master N series Absent

2005 .554 40 24 >> WARNING: Ring is not usually narrow

2006 .635 40 28 >> WARNING: Ring is not usually narrow

>> WARNING: Last ring in series is ABSENT

89a Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1912 116 50 127 108 83 102 61 111

1920 39 11 69 57 79 102 138 147 172 249

1930 290 186 112 64 122 174 127 160 141 178

1940 243 198 190 235 166 109 112 194 132 79

1950 134 161 148 83 169 211 235 195 196 181

1960 180 236 187 194 200 151 181 221 255 185

1970 173 162 165 187 140 78 100 99 127 89

1980 86 96 114 79 82 69 67 111 72 59

1990 68 69 67 87 88 82 85 73 69 36

2000 35 16 29 6 18 0 0

====================================================================================================================================

89b 1915 to 2006 92 years Series 18

[B] Entire series, effect on correlation ( .621) is:

Lower 1926< -.021 1985> -.019 1983> -.017 1932> -.013 1919> -.011 1969< -.011 Higher 1975 .037 1953 .031

[D] 2 Absent rings: Year Master N series Absent

2005 .554 40 24 >> WARNING: Ring is not usually narrow

2006 .635 40 28 >> WARNING: Ring is not usually narrow

>> WARNING: Last ring in series is ABSENT

89b Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1915 104 67 79 63 125

1920 125 31 90 17 62 111 34 82 75 124

1930 132 98 113 115 159 183 80 161 157 175

1940 229 155 157 206 187 75 77 123 105 67

1950 111 121 121 66 126 151 168 127 119 144

1960 158 176 144 198 156 143 123 145 128 115

1970 112 134 144 134 97 73 113 119 153 88

1980 73 92 123 103 96 100 90 104 84 34

1990 37 65 24 50 67 55 55 50 54 22

2000 11 55 71 13 33 0 0

====================================================================================================================================

90a 1911 to 2006 96 years Series 19

[B] Entire series, effect on correlation ( .548) is:

Lower 1968< -.019 2005< -.018 1930< -.017 1911< -.017 1947< -.014 2000> -.012 Higher 1945 .049 1932 .015

[D] 2 Absent rings: Year Master N series Absent

2005 .554 40 24 >> WARNING: Ring is not usually narrow

2006 .635 40 28 >> WARNING: Ring is not usually narrow

>> WARNING: Last ring in series is ABSENT

90a Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1911 76 155 121 209 197 204 164 198 173

1920 252 191 168 133 150 214 245 223 204 192

1930 158 204 146 191 218 260 230 209 193 185

1940 232 264 220 274 188 58 40 69 93 124

1950 177 180 168 131 191 227 273 164 196 205

1960 193 202 160 171 183 216 172 183 83 125

1970 104 108 89 164 147 78 76 109 72 42

1980 52 63 85 62 75 56 58 57 34 31

1990 35 38 18 25 37 32 30 35 39 18

2000 35 20 24 4 14 0 0

====================================================================================================================================

90b 1911 to 2006 96 years Series 20

[B] Entire series, effect on correlation ( .558) is:

Lower 1966> -.019 1928< -.017 1911< -.016 1978< -.014 1933> -.012 1947< -.011 Higher 1975 .029 1945 .022

90b Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1911 79 145 130 215 177 192 184 232 165

1920 260 195 176 146 125 165 185 197 160 203

1930 179 193 127 182 195 219 195 207 171 207

1940 247 249 215 225 144 36 29 30 45 40

1950 83 163 188 118 142 194 165 74 136 159

1960 126 161 86 182 164 162 175 236 118 121

1970 120 107 85 127 136 76 87 91 70 55

1980 53 73 113 75 95 71 72 94 63 53

1990 36 45 21 29 54 58 64 62 78 52

2000 61 32 61 2 72 61 47

====================================================================================================================================

91a 1939 to 2006 68 years Series 21

[A] Segment High -10 -9 -8 -7 -6 -5 -4 -3 -2 -1 +0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10

--------- ---- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- ---

1977 2006 -4 -.04 .04 .16 -.18 -.07 -.12 .45\* .03 -.06 -.43 .23| - - - - - - - - - -

[B] Entire series, effect on correlation ( .622) is:

Lower 1985> -.034 1987< -.028 1962> -.019 1944< -.018 1969< -.015 2000> -.013 Higher 1975 .079 1945 .070

1977 to 2006 segment:

Lower 1985> -.096 1987< -.080 2000> -.035 1996< -.030 2005< -.029 1977< -.020 Higher 2003 .102 1983 .052

[D] 2 Absent rings: Year Master N series Absent

2003 -1.664 40 17

2006 .635 40 28 >> WARNING: Ring is not usually narrow

>> WARNING: Last ring in series is ABSENT

91a Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1939 73

1940 125 135 165 177 85 27 119 191 143 202

1950 308 349 260 153 226 302 304 275 306 262

1960 316 339 312 332 340 315 198 264 215 174

1970 146 194 131 225 185 62 101 83 112 93

1980 97 133 150 73 75 127 127 55 78 43

1990 126 111 80 68 90 41 19 36 40 14

2000 55 19 44 0 36 5 0

====================================================================================================================================

91b 1930 to 2006 77 years Series 22

[B] Entire series, effect on correlation ( .450) is:

Lower 1987< -.140 1985> -.016 1979> -.014 2006< -.012 1989> -.012 1946> -.010 Higher 1945 .091 1953 .043

[D] 2 Absent rings: Year Master N series Absent

1987 1.005 40 1 >> WARNING: Ring is not usually narrow

2001 -.341 40 4 >> WARNING: Ring is not usually narrow

[E] Outliers 1 3.0 SD above or -4.5 SD below mean for year

1987 -6.0 SD

91b Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1930 142 121 15 30 49 53 14 19 56 53

1940 64 132 226 187 155 39 168 233 229 272

1950 394 515 404 233 315 339 386 380 361 297

1960 309 350 310 326 285 426 290 370 290 315

1970 218 245 140 175 91 42 84 103 89 112

1980 129 145 126 45 53 79 74 0 66 71

1990 49 71 40 49 91 73 41 70 100 68

2000 44 0 53 15 39 72 15

====================================================================================================================================

92a 1942 to 2006 65 years Series 23

[A] Segment High -10 -9 -8 -7 -6 -5 -4 -3 -2 -1 +0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10

--------- ---- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- ---

1942 1971 8 -.06 -.05 .01 -.11 -.39 .12 .12 -.11 -.15 .21 .38|-.02 -.19 .01 -.01 .04 -.26 .01 .48\*-.04 -.23

1950 1979 8 -.13 .02 .01 -.15 -.28 .18 .29 -.33 -.12 -.03 .29| .12 -.22 -.07 .09 .08 -.14 -.14 .39\* .14 -.09

1965 1994 8 -.05 .10 .17 -.24 -.05 -.04 .36 -.23 -.05 -.16 .28| .12 -.20 -.03 .07 .00 -.16 -.10 .44\* .07 -.08

[B] Entire series, effect on correlation ( .472) is:

Lower 1967< -.223 1975> -.032 1998< -.017 1963< -.011 1968> -.010 1993> -.006 Higher 1953 .024 1983 .023

1942 to 1971 segment:

Lower 1967< -.426 1968> -.019 1963< -.017 1958< -.003 1960> -.001 1964< -.001 Higher 1953 .051 1945 .039

1950 to 1979 segment:

Lower 1967< -.387 1975> -.049 1968> -.018 1963< -.016 1958< -.002 1960> -.001 Higher 1979 .065 1953 .064

1965 to 1994 segment:

Lower 1967< -.373 1975> -.054 1968> -.017 1993> -.010 1981< -.005 1984> -.003 Higher 1979 .059 1983 .058

[C] Year-to-year changes diverging by over 4.0 std deviations:

1966 1967 -4.3 SD 1967 1968 4.8 SD

[D] 1 Absent rings: Year Master N series Absent

2003 -1.664 40 17

[E] Outliers 1 3.0 SD above or -4.5 SD below mean for year

1967 -7.2 SD

92a Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1942 269 307 403 181 166 272 172 217

1950 287 323 292 176 333 403 369 269 208 282

1960 277 308 208 203 218 264 181 96 263 345

1970 220 287 217 300 199 213 252 217 246 166

1980 208 198 238 160 205 180 238 213 191 143

1990 245 163 87 173 188 150 163 175 40 46

2000 13 13 52 0 57 46 36

====================================================================================================================================

92b 1921 to 2006 86 years Series 24

[A] Segment High -10 -9 -8 -7 -6 -5 -4 -3 -2 -1 +0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10

--------- ---- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- ---

1965 1994 0 .16 -.14 .20 -.14 .25 -.27 .18 -.22 .15 -.19 .38\*-.15 .16 -.04 .02 -.09 -.16 .02 -.15 .13 .18

1977 2006 0 .24 .04 .24 -.13 .18 -.20 .10 -.29 .17 .12 .39\* - - - - - - - - - -

[B] Entire series, effect on correlation ( .423) is:

Lower 1975> -.036 1974< -.027 1980> -.018 1923> -.012 1921> -.011 1933> -.010 Higher 1983 .014 1943 .014

1965 to 1994 segment:

Lower 1975> -.119 1980> -.033 1974< -.032 1965< -.014 1993> -.014 1992> -.011 Higher 1979 .081 1969 .027

1977 to 2006 segment:

Lower 1980> -.050 1997< -.026 2003> -.026 1993> -.021 1992> -.016 2002< -.013 Higher 1979 .094 1985 .039

[C] Year-to-year changes diverging by over 4.0 std deviations:

1974 1975 5.1 SD 1979 1980 4.9 SD

[D] 5 Absent rings: Year Master N series Absent

1974 -.009 40 1 >> WARNING: Ring is not usually narrow

1979 -1.048 40 1

2002 .636 40 4 >> WARNING: Ring is not usually narrow

2003 -1.664 40 17

2005 .554 40 24 >> WARNING: Ring is not usually narrow

[E] Outliers 2 3.0 SD above or -4.5 SD below mean for year

1974 -5.1 SD; 1979 -6.7 SD

92b Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1921 82 63 91 67 87 111 167 169 171

1930 162 134 115 176 182 186 159 230 157 169

1940 206 218 259 402 327 180 189 293 165 167

1950 209 195 251 169 225 282 305 300 218 186

1960 236 268 172 173 215 144 110 190 191 327

1970 195 219 163 145 0 118 151 159 153 0

1980 180 138 132 81 113 81 106 131 131 111

1990 98 110 120 131 130 99 101 76 112 104

2000 60 10 0 0 6 0 21

====================================================================================================================================

93a 1946 to 2006 61 years Series 25

[B] Entire series, effect on correlation ( .726) is:

Lower 1955< -.025 1956< -.021 2005< -.017 1948> -.013 1982< -.008 1980> -.006 Higher 1975 .060 1953 .023

93a Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1946 114 265 162 162

1950 250 213 190 67 242 171 177 223 273 197

1960 213 268 199 294 276 342 158 277 218 296

1970 238 258 258 289 227 119 215 239 231 136

1980 206 273 172 137 133 136 182 254 155 137

1990 221 130 107 122 205 81 176 270 301 151

2000 124 94 75 6 70 32 33

====================================================================================================================================

93b 1940 to 2006 67 years Series 26

[B] Entire series, effect on correlation ( .572) is:

Lower 1945> -.038 1956< -.029 1982< -.018 1984< -.009 1980> -.009 1975> -.009 Higher 1953 .044 2003 .019

93b Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1940 84 99 154 189 99 95 96 175 71 53

1950 159 127 129 40 130 153 122 179 228 175

1960 228 267 209 309 287 410 192 322 183 220

1970 211 263 230 321 204 176 217 191 184 144

1980 203 206 145 142 107 135 179 199 174 130

1990 200 120 126 83 132 64 126 183 90 64

2000 31 14 64 7 38 44 34

====================================================================================================================================

94a 1944 to 2006 63 years Series 27

[A] Segment High -10 -9 -8 -7 -6 -5 -4 -3 -2 -1 +0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10

--------- ---- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- ---

1977 2006 -1 -.12 -.22 .15 -.06 -.13 .13 .14 .21 -.14 .23\* .22| - - - - - - - - - -

[B] Entire series, effect on correlation ( .505) is:

Lower 2005< -.036 1986< -.030 1971< -.025 1989> -.024 2006< -.017 1949> -.016 Higher 1975 .086 1953 .052

1977 to 2006 segment:

Lower 2005< -.084 1986< -.070 1989> -.057 2006< -.038 1984> -.033 1992> -.019 Higher 2003 .172 1997 .046

[D] 3 Absent rings: Year Master N series Absent

2003 -1.664 40 17

2005 .554 40 24 >> WARNING: Ring is not usually narrow

2006 .635 40 28 >> WARNING: Ring is not usually narrow

>> WARNING: Last ring in series is ABSENT

94a Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1944 181 123 140 147 147 188

1950 200 208 116 75 164 164 179 129 119 127

1960 130 173 129 113 102 158 103 134 81 142

1970 96 75 86 127 136 74 90 143 153 121

1980 109 157 158 127 177 148 119 148 150 179

1990 175 181 171 135 158 196 127 172 159 96

2000 124 94 135 0 13 0 0

====================================================================================================================================

94b 1954 to 2006 53 years Series 28

[A] Segment High -10 -9 -8 -7 -6 -5 -4 -3 -2 -1 +0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10

--------- ---- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- ---

1977 2006 0 -.17 -.36 .24 .00 -.28 -.05 -.09 .06 -.11 -.14 .36\* - - - - - - - - - -

[B] Entire series, effect on correlation ( .522) is:

Lower 1984> -.038 1989> -.030 1962> -.028 1976< -.025 2005< -.024 1995> -.014 Higher 1975 .189 2003 .036

1977 to 2006 segment:

Lower 1984> -.066 2005< -.056 1989> -.048 2004< -.030 2006< -.029 1982< -.029 Higher 2003 .153 1983 .065

[D] 2 Absent rings: Year Master N series Absent

2005 .554 40 24 >> WARNING: Ring is not usually narrow

2006 .635 40 28 >> WARNING: Ring is not usually narrow

>> WARNING: Last ring in series is ABSENT

[E] Outliers 1 3.0 SD above or -4.5 SD below mean for year

1984 +3.0 SD

94b Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1954 129 180 191 148 122 162

1960 180 214 203 195 196 239 143 247 197 231

1970 150 209 164 160 167 104 133 175 200 169

1980 161 208 168 153 241 183 167 225 175 190

1990 165 155 166 165 210 203 160 125 93 82

2000 79 70 86 4 12 0 0

====================================================================================================================================

95a 1926 to 2006 81 years Series 29

[A] Segment High -10 -9 -8 -7 -6 -5 -4 -3 -2 -1 +0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10

--------- ---- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- ---

1950 1979 -4 -.10 .15 .34 -.21 -.07 -.04 .34\*-.24 -.07 -.34 .34| .00 -.21 -.25 .08 .29 .19 -.27 -.22 .10 -.03

1965 1994 -4 .24 .32 .21 -.34 .10 .03 .44\*-.13 -.18 -.12 .30| .14 -.26 -.07 .01 .30 .04 -.09 -.35 -.10 -.11

[B] Entire series, effect on correlation ( .505) is:

Lower 1975> -.078 1938> -.028 1966> -.025 1984< -.014 1969< -.014 1949> -.013 Higher 1945 .066 2003 .021

1950 to 1979 segment:

Lower 1975> -.179 1966> -.054 1969< -.044 1968> -.012 1979> -.006 1960> -.006 Higher 1953 .090 1962 .062

1965 to 1994 segment:

Lower 1975> -.169 1966> -.047 1969< -.036 1984< -.021 1968> -.012 1988< -.011 Higher 1983 .050 1989 .047

[D] 4 Absent rings: Year Master N series Absent

2003 -1.664 40 17

2004 .277 40 17 >> WARNING: Ring is not usually narrow

2005 .554 40 24 >> WARNING: Ring is not usually narrow

2006 .635 40 28 >> WARNING: Ring is not usually narrow

>> WARNING: Last ring in series is ABSENT

[E] Outliers 1 3.0 SD above or -4.5 SD below mean for year

1975 +3.4 SD

95a Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1926 162 220 179 170

1930 181 165 115 126 128 126 120 132 220 162

1940 178 124 104 115 77 27 28 73 83 127

1950 157 123 120 71 83 144 130 91 83 121

1960 151 153 92 142 119 147 172 189 162 125

1970 99 144 129 168 125 136 133 125 125 112

1980 108 112 111 83 65 68 73 90 63 43

1990 79 81 76 68 76 44 48 84 78 41

2000 40 37 25 0 0 0 0

====================================================================================================================================

95b 1923 to 2006 84 years Series 30

[A] Segment High -10 -9 -8 -7 -6 -5 -4 -3 -2 -1 +0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10

--------- ---- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- ---

1965 1994 -9 .01 .60\*-.19 -.13 -.08 .22 .08 -.21 .14 -.11 .39| .07 -.02 -.29 .12 -.02 -.03 -.06 .10 -.06 -.26

1977 2006 -9 .18 .62\*-.27 -.14 -.05 .31 .02 -.10 .14 .11 .36| - - - - - - - - - -

[B] Entire series, effect on correlation ( .482) is:

Lower 1984< -.041 1923> -.041 1977< -.018 1933> -.017 1938> -.013 1924> -.013 Higher 1945 .048 1932 .023

1965 to 1994 segment:

Lower 1984< -.121 1977< -.048 1983> -.028 1970> -.022 1979> -.016 1980> -.011 Higher 1985 .034 1978 .022

1977 to 2006 segment:

Lower 1984< -.093 1983> -.049 1977< -.041 1979> -.031 1980> -.019 1993> -.013 Higher 2003 .071 1997 .062

[D] 4 Absent rings: Year Master N series Absent

2003 -1.664 40 17

2004 .277 40 17 >> WARNING: Ring is not usually narrow

2005 .554 40 24 >> WARNING: Ring is not usually narrow

2006 .635 40 28 >> WARNING: Ring is not usually narrow

>> WARNING: Last ring in series is ABSENT

95b Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1923 160 144 131 89 102 98 101

1930 86 70 34 86 87 82 58 123 139 117

1940 135 84 121 132 66 10 18 100 84 116

1950 63 115 98 51 62 132 127 93 94 126

1960 137 123 55 90 97 102 77 106 73 125

1970 142 151 146 119 82 65 128 65 114 90

1980 89 88 90 78 39 37 56 66 45 44

1990 50 52 51 53 63 39 66 92 51 31

2000 32 27 32 0 0 0 0

====================================================================================================================================

96a 1915 to 2006 92 years Series 31

[B] Entire series, effect on correlation ( .614) is:

Lower 1966< -.033 1949> -.024 1921> -.019 1985> -.017 1915< -.014 1919> -.010 Higher 1945 .023 2003 .017

[D] 1 Absent rings: Year Master N series Absent

1946 -2.045 39 1

96a Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1915 39 49 38 110 186

1920 221 206 143 93 114 174 118 154 105 138

1930 105 95 62 52 109 103 66 127 108 128

1940 96 92 94 97 86 29 0 36 44 167

1950 110 158 130 70 108 181 200 201 115 114

1960 139 172 123 141 121 153 83 130 112 119

1970 114 132 119 157 132 92 150 128 152 106

1980 70 89 106 82 90 108 151 143 78 48

1990 62 60 68 56 92 69 90 107 105 80

2000 45 23 41 6 8 11 14

====================================================================================================================================

96b 1926 to 2006 81 years Series 32

[B] Entire series, effect on correlation ( .693) is:

Lower 1938> -.018 1974> -.016 1954< -.015 1994< -.014 2004< -.013 1989> -.012 Higher 1975 .049 1953 .024

[D] 2 Absent rings: Year Master N series Absent

2003 -1.664 40 17

2004 .277 40 17 >> WARNING: Ring is not usually narrow

96b Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1926 179 274 183 210

1930 179 161 90 85 105 122 99 144 167 188

1940 134 118 103 94 136 71 71 118 85 79

1950 130 112 110 59 60 114 175 143 109 127

1960 149 131 104 111 105 97 76 153 125 124

1970 91 110 85 99 128 62 81 79 92 56

1980 47 59 80 50 54 46 62 70 40 44

1990 28 39 23 13 21 27 34 27 57 49

2000 38 36 53 0 0 17 11

====================================================================================================================================

97a 1926 to 2006 81 years Series 33

[A] Segment High -10 -9 -8 -7 -6 -5 -4 -3 -2 -1 +0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10

--------- ---- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- ---

1935 1964 0 -.13 -.17 .03 .00 -.04 .02 -.01 -.04 -.10 .00 .42\*-.07 -.16 -.28 .34 -.19 -.20 .18 .24 -.14 .08

1950 1979 0 -.28 .18 -.06 .34 -.37 .02 -.12 .00 -.08 -.09 .41\*-.18 .12 -.51 .28 -.14 .34 -.41 .04 -.24 .29

1965 1994 -9 -.19 .51\* .10 -.02 -.35 .20 .19 .20 -.16 -.27 .46| .12 .08 -.45 .19 .00 .12 -.14 -.07 -.25 .11

[B] Entire series, effect on correlation ( .432) is:

Lower 1945> -.029 1938< -.022 1957> -.014 2002< -.012 2005< -.012 1980> -.011 Higher 1983 .020 1953 .019

1935 to 1964 segment:

Lower 1945> -.092 1938< -.049 1957> -.031 1963< -.022 1944< -.010 1960< -.010 Higher 1953 .041 1962 .031

1950 to 1979 segment:

Lower 1957> -.046 1963< -.038 1973< -.033 1974> -.023 1960< -.023 1972> -.022 Higher 1953 .085 1962 .045

1965 to 1994 segment:

Lower 1988< -.060 1973< -.039 1980> -.026 1974> -.018 1972> -.015 1968> -.014 Higher 1983 .057 1985 .031

[D] 2 Absent rings: Year Master N series Absent

2005 .554 40 24 >> WARNING: Ring is not usually narrow

2006 .635 40 28 >> WARNING: Ring is not usually narrow

>> WARNING: Last ring in series is ABSENT

[E] Outliers 1 3.0 SD above or -4.5 SD below mean for year

1938 -4.7 SD

97a Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1926 111 150 114 160

1930 139 80 79 52 59 101 64 88 19 87

1940 110 56 91 96 49 58 43 109 65 19

1950 106 123 67 20 36 103 121 231 132 131

1960 36 70 23 39 45 74 85 121 122 116

1970 119 137 199 105 162 95 166 106 128 81

1980 143 164 137 52 40 45 88 138 42 64

1990 149 102 98 110 125 36 143 140 109 56

2000 56 57 16 4 9 0 0

====================================================================================================================================

97b 1920 to 2006 87 years Series 34

[A] Segment High -10 -9 -8 -7 -6 -5 -4 -3 -2 -1 +0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10

--------- ---- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- ---

1965 1994 -9 -.13 .56\* .12 .07 -.29 .15 .17 .09 -.23 -.07 .48| .04 .02 -.39 .05 .05 .03 -.13 -.01 -.09 -.10

[B] Entire series, effect on correlation ( .548) is:

Lower 1945> -.020 1984< -.017 1946> -.013 2002< -.012 1957> -.011 1979> -.011 Higher 1983 .016 1975 .014

1965 to 1994 segment:

Lower 1984< -.067 1988< -.034 1979> -.026 1986< -.021 1969< -.019 1974> -.014 Higher 1975 .076 1983 .055

[D] 6 Absent rings: Year Master N series Absent

1948 -1.163 39 1

2002 .636 40 4 >> WARNING: Ring is not usually narrow

2003 -1.664 40 17

2004 .277 40 17 >> WARNING: Ring is not usually narrow

2005 .554 40 24 >> WARNING: Ring is not usually narrow

2006 .635 40 28 >> WARNING: Ring is not usually narrow

>> WARNING: Last ring in series is ABSENT

97b Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1920 241 90 112 51 65 109 66 165 128 121

1930 128 77 73 48 66 104 24 102 15 71

1940 100 51 77 84 53 41 56 134 0 3

1950 12 76 83 23 36 121 137 227 103 131

1960 36 100 29 57 102 154 88 109 89 95

1970 103 178 195 129 168 79 140 115 147 110

1980 118 132 98 42 20 49 37 89 19 50

1990 78 58 50 78 135 36 138 140 134 100

2000 32 42 0 0 0 0 0

====================================================================================================================================

98a 1931 to 2006 76 years Series 35

[B] Entire series, effect on correlation ( .549) is:

Lower 1999< -.036 1975> -.027 2006< -.025 1967< -.012 1974> -.010 1961< -.009 Higher 1945 .076 1953 .024

[D] 2 Absent rings: Year Master N series Absent

1999 .295 40 1 >> WARNING: Ring is not usually narrow

2006 .635 40 28 >> WARNING: Ring is not usually narrow

>> WARNING: Last ring in series is ABSENT

98a Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1931 56 19 33 75 73 56 64 55 45

1940 80 64 67 90 56 14 58 78 80 43

1950 164 140 109 40 145 179 168 168 117 115

1960 115 86 88 75 135 70 59 61 20 61

1970 38 56 81 150 154 85 140 115 107 83

1980 91 104 110 70 98 87 89 105 94 61

1990 110 101 63 62 117 50 94 115 55 0

2000 38 17 27 9 12 14 0

====================================================================================================================================

98b 1930 to 2006 77 years Series 36

[A] Segment High -10 -9 -8 -7 -6 -5 -4 -3 -2 -1 +0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10

--------- ---- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- ---

1930 1959 5 -.12 -.20 .26 .21 -.01 -.10 -.04 .13 -.24 -.25 .30| .04 .04 -.33 .24 .43\* .21 .10 -.11 .33 .17

1935 1964 5 -.04 -.15 .20 .16 -.26 -.27 -.17 .03 -.21 -.25 .30|-.07 .08 -.31 .25 .39\* .14 -.01 -.08 .17 .02

1950 1979 4 -.05 -.02 .19 -.05 -.21 -.17 -.04 -.17 -.25 -.12 .37| .02 -.17 -.36 .46\* .32 -.08 -.23 -.20 .15 .05

[B] Entire series, effect on correlation ( .342) is:

Lower 2006< -.044 2004< -.041 1933> -.033 1961< -.026 1943< -.022 2003> -.018 Higher 1945 .068 1983 .016

1930 to 1959 segment:

Lower 1933> -.090 1943< -.083 1940< -.043 1939< -.036 1941< -.030 1957> -.014 Higher 1945 .189 1932 .026

1935 to 1964 segment:

Lower 1961< -.075 1943< -.061 1940< -.028 1957> -.024 1939< -.023 1946> -.021 Higher 1945 .179 1962 .031

1950 to 1979 segment:

Lower 1961< -.104 1966> -.042 1971< -.040 1963< -.019 1957> -.017 1968> -.016 Higher 1975 .080 1953 .053

[D] 4 Absent rings: Year Master N series Absent

1945 -2.631 38 3

2000 -.329 40 2 >> WARNING: Ring is not usually narrow

2004 .277 40 17 >> WARNING: Ring is not usually narrow

2006 .635 40 28 >> WARNING: Ring is not usually narrow

>> WARNING: Last ring in series is ABSENT

98b Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1930 36 36 22 54 60 58 26 52 37 17

1940 16 16 54 33 27 0 34 112 57 36

1950 148 138 109 47 112 143 166 178 105 81

1960 55 35 28 62 62 101 129 165 127 115

1970 66 58 106 126 95 67 82 149 115 85

1980 69 107 98 62 99 71 106 125 68 41

1990 51 109 73 52 105 41 110 122 140 65

2000 0 53 31 32 0 17 0

====================================================================================================================================

99a 1921 to 2006 86 years Series 37

[B] Entire series, effect on correlation ( .633) is:

Lower 1973< -.044 1948< -.023 1962> -.013 1956< -.011 1933> -.010 2004< -.009 Higher 1945 .027 2003 .015

99a Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1921 145 159 127 98 179 135 138 150 144

1930 144 93 78 124 132 148 92 156 101 99

1940 140 153 147 217 115 29 61 153 40 96

1950 124 134 172 126 163 208 162 172 194 191

1960 173 257 226 258 237 215 155 181 160 241

1970 198 260 268 140 155 158 213 177 219 171

1980 174 188 188 169 181 169 194 204 172 132

1990 155 166 156 157 159 117 143 173 131 73

2000 44 55 56 14 19 42 30

====================================================================================================================================

99b 1931 to 2006 76 years Series 38

[B] Entire series, effect on correlation ( .638) is:

Lower 1973< -.022 1933> -.021 1932< -.020 1979> -.017 1994< -.014 1992> -.014 Higher 1975 .050 2003 .012

99b Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1931 117 71 115 151 146 124 139 108 120

1940 157 133 147 174 165 65 39 96 45 71

1950 70 120 136 116 198 289 297 294 207 220

1960 207 303 187 209 181 226 160 195 220 304

1970 186 202 202 158 145 117 178 164 189 180

1980 182 180 171 131 141 138 170 182 128 131

1990 135 154 163 119 104 94 113 134 105 64

2000 44 53 69 31 64 62 29

====================================================================================================================================

100a 1926 to 2006 81 years Series 39

[A] Segment High -10 -9 -8 -7 -6 -5 -4 -3 -2 -1 +0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10

--------- ---- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- ---

1926 1955 0 .16 -.02 .06 -.03 -.15 -.14 .22 .08 -.21 .39 .42\*-.14 -.32 .15 .02 .05 -.20 -.24 -.14 .04 -.41

[B] Entire series, effect on correlation ( .563) is:

Lower 1927< -.031 1945> -.023 1985> -.018 1938> -.017 1936> -.014 1929< -.013 Higher 1975 .046 1953 .023

1926 to 1955 segment:

Lower 1927< -.063 1945> -.045 1938> -.038 1936> -.032 1929< -.023 1942< -.014 Higher 1953 .070 1948 .035

[D] 4 Absent rings: Year Master N series Absent

2003 -1.664 40 17

2004 .277 40 17 >> WARNING: Ring is not usually narrow

2005 .554 40 24 >> WARNING: Ring is not usually narrow

2006 .635 40 28 >> WARNING: Ring is not usually narrow

>> WARNING: Last ring in series is ABSENT

100a Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1926 160 110 134 108

1930 144 179 104 50 107 111 134 95 144 98

1940 89 163 64 114 126 65 25 144 37 19

1950 31 55 53 23 72 86 99 101 139 193

1960 164 232 121 171 161 178 165 219 190 209

1970 175 183 134 146 139 99 166 154 172 103

1980 96 144 130 91 95 135 158 168 122 105

1990 150 145 163 120 126 95 137 135 147 90

2000 77 71 59 0 0 0 0

====================================================================================================================================

100b 1921 to 2006 86 years Series 40

[A] Segment High -10 -9 -8 -7 -6 -5 -4 -3 -2 -1 +0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10

--------- ---- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- ---

1921 1950 -1 .14 .00 -.27 -.01 -.12 -.30 -.15 .04 .06 .56\* .41|-.03 -.19 .01 -.28 .02 .00 -.05 .11 .00 -.37

[B] Entire series, effect on correlation ( .533) is:

Lower 1989< -.018 1921> -.017 1927< -.017 1936> -.016 1974< -.012 1949> -.010 Higher 1975 .034 1953 .017

1921 to 1950 segment:

Lower 1927< -.049 1921> -.041 1936> -.038 1937< -.030 1949> -.022 1947< -.017 Higher 1946 .053 1948 .045

[D] 4 Absent rings: Year Master N series Absent

2003 -1.664 40 17

2004 .277 40 17 >> WARNING: Ring is not usually narrow

2005 .554 40 24 >> WARNING: Ring is not usually narrow

2006 .635 40 28 >> WARNING: Ring is not usually narrow

>> WARNING: Last ring in series is ABSENT

[E] Outliers 1 3.0 SD above or -4.5 SD below mean for year

1989 -5.7 SD

100b Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1921 130 127 86 64 83 134 89 118 121

1930 124 177 103 35 110 113 152 70 112 81

1940 113 165 117 102 134 56 12 50 17 96

1950 110 105 70 38 102 121 122 93 66 190

1960 148 192 99 149 149 163 131 172 146 179

1970 143 173 202 195 98 77 142 129 130 105

1980 111 123 126 83 89 97 155 126 56 6

1990 90 120 127 84 160 83 146 109 120 59

2000 63 55 38 0 0 0 0

====================================================================================================================================

PART 7: DESCRIPTIVE STATISTICS: Appalachian Gap Corr5-30 10:35 Mon 12 Feb 2007 Page 6

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Corr //-------- Unfiltered --------\\ //---- Filtered -----\\

No. No. No. with Mean Max Std Auto Mean Max Std Auto AR

Seq Series Interval Years Segmt Flags Master msmt msmt dev corr sens value dev corr ()

--- -------- --------- ----- ----- ----- ------ ----- ----- ----- ----- ----- ----- ----- ----- --

1 81a 1900 2006 107 6 1 .429 .77 2.32 .519 .847 .347 2.59 .400 .114 1

2 81b 1916 2006 91 6 3 .455 .85 2.43 .491 .882 .279 2.59 .426 -.039 1

3 82a 1909 2006 98 6 1 .450 .97 3.01 .598 .583 .431 2.94 .597 .049 2

4 82b 1907 2006 100 6 3 .405 .93 2.46 .517 .568 .467 2.67 .451 .004 2

5 83a 1918 2006 89 6 1 .598 1.04 2.78 .637 .681 .454 2.51 .343 .008 1

6 83b 1913 2006 94 6 1 .572 .82 1.98 .471 .630 .470 2.52 .362 .000 1

7 84a 1914 2006 93 6 1 .612 1.20 3.22 .675 .844 .303 2.47 .392 -.004 1

8 84b 1912 2006 95 6 1 .544 1.11 3.18 .733 .890 .313 2.58 .451 .057 1

9 85a 1915 2006 92 6 0 .585 1.32 3.91 1.014 .870 .382 2.70 .357 .022 1

10 85b 1910 2006 97 6 3 .276 1.48 3.37 .910 .820 .377 2.53 .441 -.003 2

11 86a 1914 2006 93 6 3 .484 1.20 3.50 .748 .706 .433 2.55 .364 -.006 1

12 86b 1911 2006 96 6 3 .323 .95 3.57 .672 .823 .336 2.61 .421 .008 1

13 87a 1913 2006 94 6 0 .662 1.27 2.55 .590 .791 .301 2.79 .515 -.008 2

14 87b 1913 2006 94 6 1 .667 1.57 3.23 .691 .730 .287 2.58 .491 .089 1

15 88a 1911 2006 96 6 0 .555 1.28 3.37 .802 .778 .356 2.61 .431 -.027 1

16 88b 1915 2006 92 6 2 .404 1.02 2.62 .725 .763 .420 2.60 .549 .028 1

17 89a 1912 2006 95 6 0 .632 1.23 2.90 .652 .809 .324 2.56 .431 .030 1

18 89b 1915 2006 92 6 0 .621 1.02 2.29 .493 .691 .371 2.66 .556 -.009 1

19 90a 1911 2006 96 6 0 .548 1.31 2.74 .777 .871 .289 2.55 .498 .032 1

20 90b 1911 2006 96 6 0 .558 1.25 2.60 .649 .790 .306 2.64 .447 -.026 3

21 91a 1939 2006 68 4 1 .622 1.48 3.49 1.019 .866 .473 2.50 .491 .041 1

22 91b 1930 2006 77 5 0 .450 1.58 5.15 1.295 .888 .481 2.64 .433 -.036 1

23 92a 1942 2006 65 4 3 .472 2.04 4.03 .936 .682 .369 2.45 .417 -.002 1

24 92b 1921 2006 86 5 2 .423 1.53 4.02 .808 .722 .400 2.45 .332 -.067 1

25 93a 1946 2006 61 4 0 .726 1.88 3.42 .758 .466 .382 2.57 .458 -.065 1

26 93b 1940 2006 67 4 0 .572 1.55 4.10 .805 .670 .393 2.63 .435 .007 1

27 94a 1944 2006 63 4 1 .505 1.30 2.08 .463 .588 .318 2.57 .604 .018 2

28 94b 1954 2006 53 3 1 .522 1.56 2.47 .602 .745 .272 2.65 .437 .090 1

29 95a 1926 2006 81 5 2 .505 1.06 2.20 .502 .822 .237 2.75 .583 .137 1

30 95b 1923 2006 84 5 2 .482 .82 1.60 .394 .672 .319 2.59 .485 .046 1

31 96a 1915 2006 92 6 0 .614 1.03 2.21 .479 .681 .350 2.47 .405 -.004 1

32 96b 1926 2006 81 5 0 .693 .92 2.74 .526 .808 .308 2.63 .544 .042 1

33 97a 1926 2006 81 5 3 .432 .89 2.31 .481 .483 .497 2.67 .461 -.032 1

34 97b 1920 2006 87 5 1 .548 .84 2.41 .524 .449 .568 2.66 .539 .053 2

35 98a 1931 2006 76 5 0 .549 .79 1.79 .423 .606 .457 2.51 .471 .000 1

36 98b 1930 2006 77 5 3 .342 .74 1.78 .443 .623 .555 2.69 .568 -.045 2

37 99a 1921 2006 86 5 0 .633 1.48 2.68 .568 .709 .266 2.54 .417 -.011 2

38 99b 1931 2006 76 5 0 .638 1.46 3.04 .640 .782 .244 2.62 .415 -.006 1

39 100a 1926 2006 81 5 1 .563 1.16 2.32 .530 .665 .330 2.57 .537 .062 1

40 100b 1921 2006 86 5 1 .533 1.05 2.02 .480 .556 .407 2.50 .441 .100 1

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Total or mean: 3428 214 45 .528 1.17 5.15 .648 .726 .372 2.94 .458 .017

- = [ COFECHA APPGACOF ] = -